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Schools of Horticulture.

A CORRESPONDENT describes upon another page the organization of the National School of Horticulture of France, one of the most successful in Europe for the purpose for which it was established—the training of practical, working gardeners. The theory of the school is, that instruction in horticulture, if it is to be of any value, must be both practical and scientific. The courses of instruction, therefore, extend over a period sufficiently long to permit the students to acquire, by actual practice, under experienced cultivators, the skill which will enable them to perform all the operations of the garden in its various departments, and to learn, from lectures and by study, something of the sciences upon which the art of horticulture rests. All the operations of the establishment, which is a large one and admirably kept, are performed by the students; and, although it is not self-supporting, the sales of produce of various kinds are sufficient to pay a considerable part of the expenses, including the salaries of several instructors. The institution is an excellent example, certainly, of what a large School of Horticulture can be made.

A number of Schools of Horticulture were established in this country several years ago, and some of them are still in operation. They have all been connected, more or less intimately, with agricultural colleges; for, with the exception of a school for women which existed for a short time in Newton, Massachusetts, a few years ago, there has been no institution in this country devoted solely to horticultural instruction. These schools have, in some instances, done admirable work as horticultural experiment-stations, and the country is indebted to them, in their capacity as such, for much valuable information. Many of them now provide an excellent course of botanical study and offer instruction in some branches of practical horticulture. It will not, however, be maintained by the best friends of these schools, that a well equipped gardener was ever graduated from any one of them.

The causes of the failure of these schools are deep seated. They spring, in part, from the want of appreciation of the requirement of a sound horticultural education on the part of their founders, and in part from the prevailing tendency of the American people to be satisfied with a hasty and insufficient training for any vocation in life. A young man who devotes an hour or two a week during the thirty or forty weeks of a school course, even if his studies are carried into the second year, may find a certain amount of satisfaction in thus playing at horticulture, but he will gain little that will be of any practical value to him in earning his living as a gardener. And yet, to create gardeners of broader intelligence and greater skill than can be gained from the rule-of-thumb system of the old apprentice days, is the only legitimate purpose for which such schools can be established merely as schools.

But the directors of our Schools of Horticulture are not altogether responsible for the existing state of affairs. Americans are in too great a hurry to learn anything thoroughly. The lad who has passed a few months in some successful florist's green-house, or in the garden of some private establishment of good reputation, is generally pretty sure, in this country, to obtain a responsible situation in which he is practically his own master, and where he gets as high wages as if he had devoted a number of years to learning his profession. It is not surprising, therefore, that Schools of Horticulture are not supported in this country, and that the number of ignorant and half-trained gardeners is far in excess of those who really understand their business. The best gardeners in America, with a few exceptions, are foreign born, and got their early training before they came to this country. Really good gardeners are rare, of course, in every country, for the combination of knowledge with the qualities that make a great gardener is seldom found. They are more rare here, however, than they are in Europe, because absence of competition permits very inferior men to aspire to important positions; and we must continue to depend, as a rule, upon foreign nations for gardeners, until the struggle for existence here is so sharp that only men thoroughly trained in their profession can hope to live by it, or until a more general knowledge of gardening and its possibilities among the class who employ labor makes it impossible for ignorant men to obtain positions requiring such a high order of intelligence, industry and zeal. Such a change will come to pass, perhaps, in the United States, sooner or later; but in the meantime our Schools of Horticulture can wisely give up trying to teach young men who do not want to be taught, and devote their energies to those wider fields of usefulness which, fortunately, are open to them, and by experiments, and in many other ways, at least help to create the demand for skilled gardeners which they were founded to supply.

There is no better season of the year than winter to study trees with reference to their surroundings, or to determine the amount of the damage inflicted by one tree upon another when they are brought together too closely in ornamental plantations. If there is any one in this city interested in trees in their ornamental aspects, he cannot devote a few hours of one of these days of early winter, before the snow makes walking uncomfortable, to a better purpose than a stroll through Central Park. The overcrowding and the poor condition of many of the trees there is more apparent now than at any other season of the year, and tree-lovers will be able to see for themselves that many trees should be removed at once if there are to be any fine ones left in the Park at the end of another quarter of a century. Large and healthy trees are crowded in all parts of the Park by smaller and less valuable ones. There can be but one ending to the struggle between a strong and a weak tree; but the process of destruction is slow, and the victorious giant too often carries through life the marks of the contest. Man can aid nature wonderfully by the judicious use of the axe, and there is hardly an acre of the Park plantations which has not suffered, and is not now suffering, from ill-judged caution in cutting. The sickly and often half dead Norway

Spruces and foreign Pines look even more wretched and unhappy in winter than they do when the leaves cover the branches of neighboring trees. Still they are allowed to disfigure the Park year after year—while they are dying slowly—and what is a great deal more serious, they are allowed to inflict great and ever-increasing injury upon valuable trees which are unfortunate enough to stand near them. The interesting and unique Japanese Elm, near the Seventy-second Street entrance to the Park from Fifth Avenue, to which we have more than once called the attention of the lovers of rare and handsome trees, is still crowded and injured by neighbors of no value or beauty—a piece of neglect on the part of the Park authorities which is inexcusable, and should cause the indignation of all persons who can appreciate the beauty and value of this remarkable tree.

A Japanese Stable.

A FEW weeks ago we illustrated the approach to the famous memorial temples at Nikko, in Japan. On page 31 we now reproduce a photograph of one of the minor buildings within the wide temple enclosure. It is neither a temple nor a dwelling, but a stable, yet—as we might divine from its ornamentation, which is much richer than that of the habitations of Japanese humanity—not a stable destined for an ordinary steed. It houses one of the sacred ponies—albino animals with pink eyes—which are frequently found within the precincts of large temples. These ponies live on the charity of visitors to the temple, who are in the habit of piously investing a few coppers in peas or grain for their sustenance.

Despite the peculiar service to which it is put, this building is not only charming to look at, but suggestive of schemes which might serve an American architect for work of another kind. The strong yet graceful sweeping roof is, of course, its chief claim to admiration; and although such a roof is used in Japan upon sacred or semi-sacred edifices only, this canon need not bind foreigners who find it beautiful. Modified to suit our methods of construction, yet not deprived of its essential character, it might well be used to cover some minor building in the neighborhood of an American country home—a lodge or tool-house, a summer-house or well. Nor is the construction and ornamentation of the walls devoid of interest for a people like ourselves, who are often at one with the Japanese in using wood without an admixture of more monumental materials, but who have much to learn in the way of using it in fashions at once simple and strong. Rich color, of course, adds much to the effect of such Japanese buildings—so much, that their beauty, displayed, as it is, against a background of deep green foliage, cannot be at all appreciated from a black-and-white print. The flagged path in front of the stable is a good example of Japanese workmanship in another and likewise interesting direction.

Boundary Walls and Entrances for Prospect Park.

IT was decided some time ago by the Brooklyn Park Commissioners to surround a great part of Prospect Park with a substantial stone wall in place of the rough wooden paling which has stood there so long, and to furnish the chief approaches with entrances of corresponding dignity. Some of the designs for this work have now been prepared and approved, and their execution will soon be begun. An inspection of these designs shows that the park and the city will be vastly improved by the constructions which they portray.

The wall is to be low but massive, carefully profiled, and constructed of Milford granite, the soft pinkish tone of which, mottled with black, is well adapted for association with masses of verdure. At the approach facing Coney Island Avenue the wall ends at points considerably removed from one another and the entrance for carriages is set somewhat far back from its line. Each side of this entrance—which is to have no gates—is flanked by a large but not lofty rectangular pier bearing a sculptured group. From these piers long stone seats with low but massive backs curve outward toward the ends of the wall; and at the points of junction stand large rectangular pavilions, open except for a colonnade formed by square angle-piers with two intermediate columns on each side and covered with red-tiled roofs. Each long curved bench is broken midway of its length to admit of the passage of persons on foot, and behind each (within the park) stand two graceful, tall columns, bearing the national eagle. The design is classic in character, simple in its elements, but scholarly and beautiful, and exquisitely treated as regards matters of detail. The combination of the massive central piers with their groups of sculpture, the long, curving benches, the colonnaded shelters, and the tall, isolated shafts, forms a composition of the most dignified simplicity and harmonious variety. It is a great pity that in accepting this design the Commissioners should have thought best to mutilate it by the omission of the four isolated shafts. Not only are they beautiful in themselves, but their slender, aspiring lines are needed to relieve and dignify the low horizontal lines that elsewhere prevail. Without them the park will still have a good and tasteful entrance, but with them it would have an architectural adornment of the highest monumental beauty.

The design for the Willink entrance shows again no gate, but two massive round low piers, with conical roofs covered with the scale-like stone tiling familiar to all students of classic art. From the apex of these roofs rise rich finials of wrought-iron, and between them springs a lofty elaborate arch of the same material, from which depends a lantern. Long stone seats flank this entrance also, divided as before for the passage of pedestrians; but in place of the colonnaded shelters, we have here two small circular entry-boxes, with conical red-tiled roofs. This design, it will be seen, is less ambitious than the other, but it is as good in its own way; and again one must count it a great misfortune that it must be executed in a mutilated shape—the iron-work is to be entirely omitted, though it adds immensely to the effectiveness of the composition, which without it seems almost too simple and severe. In both cases, however, these mutilations can easily be rectified at a later day, and meanwhile Brooklyn may congratulate itself upon having secured the services of genuine artists for this part of its park improvements. No competition was opened for the walls, or for these two gates, or for the still simpler one which will face Third Street and Ninth Avenue. The task was given directly to Messrs. McKim, Mead and White, of this city, and the excellence of the result secured by this simple process of selecting architects of recognized ability, may well encourage other commissioners and committees to a similar course.

It remains, however, to speak of the most important item in the scheme for improving the circuit of Prospect Park. This is the gateway for the main entrance on the Plaza, which it is proposed to make a memorial to those citizens of Brooklyn who fell in the War for the Union.

Several years ago it was proposed to build such a monument on the Plaza, and a design was selected which would have cost $250,000, and represented a huge drum surmounted by emblematical figures. But the Legislature voted only $100,000 for the work, the design was fortunately abandoned, and the matter was turned over to the Board of Aldermen. This Board had almost decided to erect an isolated commemorative shaft, when it was suggested that the memorial should take the shape of a triumphal arch (such as has often been used for a similar purpose abroad and in our own country at Hartford, Connecticut), and should stand, not on the Plaza, but beyond it, forming the entrance to the park. This new idea was adopted, and the control of the scheme was placed in the hands of Mayor Chapin, the City Works Commissioner, and the President of the Grand Army of the Republic. Competitive designs were solicited by them for a monument which should cost $250,000, and these designs have recently been on view in the Brooklyn Art Rooms, on Montague Street. An inspection of them has given no such grounds for satisfaction as were felt when the drawings for the wall and the smaller entrances were studied.

Just how the competition was organized we are unable to say, but, apparently, not in the only right and proper way—as one in which all the contestants were to be paid for preparing their studies, and in which their names were to be concealed until after the committee's decision had been made. All the sets of drawings, with one exception, were signed in full; and so few of the names thus revealed were well and favorably known, that the observer was forced to believe either that no intelligent choice among American architects had been made when the circulars were sent out, or that no payment had been promised which could induce self-respecting and busy practitioners to compete. The result was what might have been

expected. A more unscholarly and inartistic collection of designs it would be impossible to imagine, or one which should be further from representing the real status of American architecture in its best developments at the present day. It is impossible here even to hint at all the vagaries, trivialities, monstrosities and veritable nightmares in the shape of triumphal arches which the collection revealed, or the manner in which Romanesque art, especially, had been maltreated and caricatured in an attempt after magnificence of general effect and symbolic significance in detail. Suffice it to say that, in the large collection there was but one really good design, and two others to which a qualified word of praise might be given. The rectangular Romanesque castle-like building which the Messrs. Parfitt Brothers, of Brooklyn, showed as their second or alternate design, had a certain dignity and grandeur, and, by contrast with its fellows, much simplicity and good sense; and with certain alterations in matters of treatment—notably as regards the four angle turrets which surmount the roof—it might be made into a fine structure. But its form is hardly appropriate for a gateway—it is a building, rather than a triumphal arch—and its style alone would render it inappropriate for the place now in view. Mr. Page Brown's classic design, on the other hand, though sensible and scholarly, lacks beauty of outline, and is too heavy and utilitarian of air.

The one design which is really excellent in itself, and really appropriate, is the single one which was sent in without a signature. It shows a deep and lofty semi-circular arch, with figures of victories in the spandrels, above which runs in large letters the simple but sufficient legend: "To the Defenders of the Union, 1861–1865." This arch is recessed between two large and solid rectangular wings, from the front of each of which projects a colonnaded portico, bearing groups of sculpture. At the level of the springing of the arch these wings are encircled by a simple but effective cornice-string, and, together with the curtain of wall above the arch, they are crowned by a true cornice, simple again, but massive, and amply sufficient to cast an effective shadow. Above this cornice is an attic, with groups of pilaster-piers and circular openings between them, crowned itself by a lighter cornice; and the whole is surmounted by a group, finely suggested in the drawing, of Victory in a chariot with plunging horses. This group is exhibited on a separate sheet, so that the effect of the arch without it may be appreciated. Even without it the effect is fine; but of course a really good sculptured group would vastly increase beauty and dignity of air. The style is classic, with Composite capitals to the portico columns. The monument, as will be seen, is very simple, yet it is not too plain, for the porticoes and the three works of sculpture would give sufficient lightness and grace, and the cornices and strings and water-tables which alone relieve the massive side walls, are charmingly profiled and adorned. On the whole, it is an excellent, scholarly and appropriate design, and the judges would commit no sin in selecting it, although their fault would be great, towards Art and towards their fellow citizens, did they even think of selecting any other among those as yet submitted. It seems strange that the necessity should not at once have been recognized of limiting the contestants to classic designs. Such designs having been chosen for the other gateways, common sense, not to speak of good taste, dictates that no Romanesque or other alien style should be chosen for the main gateway. It has not yet been announced that a decision with regard to these designs has been arrived at by the committee, so it is, perhaps, not too late to say that three courses are open to it—either to select the unsigned design just described; to put the work directly into the hands of the able architects who have undertaken the rest of the park inclosure; or to open a fresh competition, inviting a number of competent artists to take part, paying them fairly for their labor, and prescribing that only designs in a classic style shall be submitted.

The National School of Horticulture at Versailles.

THIS admirable institution for the education of practical gardeners dates from the year 1874, and is probably the best of similar schools in Europe. Its present situation is historically an interesting one and is well suited for the purpose, though perhaps the soil is rather too heavy and cold. As early as the year 1679, this piece of ground was laid out as a *potager* or kitchen-garden for Louis XIV., and for years, centuries even, it supplied the royal and imperial tables of France with vegetables, fruits and flowers.

It is entirely a free school, and the only requirements of admission necessary are, that the student on entering should be between seventeen and twenty-seven years of age, and that he should pass an easy examination in reading, writing, spelling and simple arithmetic. The regular course is for three years and at the end of each year an examination is held covering the work gone over. Those students who fail to pass this examination cease to be members of the school. Those who pass a satisfactory final examination at the end of the course receive a certificate from the Minister of Agriculture.

The work of the school is divided into eleven departments: 1. The cultivation of fruit trees in the open air and under glass; 2. The cultivation of ornamental and forest trees; 3. The cultivation of vegetables in the open air and by forcing; 4. The cultivation of flowering-plants in the open air and by forcing; 5. Elementary and descriptive Botany; 6. Principles of Landscape Gardening and Garden Architecture; 7. Elements of Physics, Meteorology, Chemistry, Geology and Mineralogy as applied to Horticulture; 8. Elements of Zoology and Entomology as applied to Horticulture and Arboriculture; 9. Geometry and Arithmetic necessary for gardening purposes; 10. Linear design and the sketching of plants and implements; 11. French Language and Book-keeping.

Instruction is given by means of lectures and recitations. In addition every student is expected to actually do his share in the necessary manual labor required for the maintenance of the gardens. The time is so divided between the theoretical and practical branches of instruction, that all the students take a part in the work of the garden every day, and divided into squads of ten or more under the guidance of well-trained master gardeners, they spend at least a fortnight in each department of the garden, thus acquiring the manual dexterity which is so indispensable. In addition to the instruction given in the school, the students are taken from time to time to visit the large horticultural establishments in France in order to make them familiar with the methods employed in them.

Good permanent collections are all the time being formed, and already there is one of seeds and cones, one of wood-specimens, a large herbarium, a quantity of models of fruits, etc., a collection of animals, birds and insects harmful to vegetation, and an excellent library. There is also a living collection of trees and shrubs, but this is in rather bad condition at present owing to overcrowding on account of lack of space and consequent heavy pruning. It serves, however, to make the students familiar with the more common varieties usually found in gardens and furnishes a constant supply of herbarium specimens.

Much attention is paid here to the espalier system of growing fruit trees, now so popular in France, and this school has, without doubt, done much towards diffusing information as to this method of growing fruit in the open air.

Paris, 1888. *H. S. Codman.*

Foreign Correspondence.

London Letter.

AFTER a week of heavy fog the unusually mild and sunny weather has returned, which, at the beginning of December, had such an extraordinary effect on vegetation. The poisonous gases of a London fog destroy most white flowers, a foggy day leaving such flowers as those of Phalænopsis, Calanthe, many Begonias and white Chrysanthemums withered or limp, as if they had been dipped in boiling water. The recent fog has done a great deal of mischief here, very few choice flowers of any kind remaining in London gardens.

In the markets the principal plants are the same as those we had at least five years ago:—Epiphyllums, *Erica hyemalis*, *E. caffra*, *E. gracilis*, Roman Hyacinths, Lily-of-the-Valley, Tulips, Marguerites, Primulas and Poinsettias. It takes a long time for a new and useful winter-flowering plant to gain favor with market-growers, so that, notwithstanding the numerous good plants of recent introduction, the market-favorites here are almost identical with those grown a generation ago. No one suspected that Epiphyllum would prove a good market plant, till one of the shrewdest and most enterprising of London market-growers tested it and found out its worth. The cut flowers of the season are the same as of old. We have Gardenias, Eucharis, Tuberose, Stephanotis, forced Lilac and a few other things of less importance. All these are abundant, and they are always in great demand. I am told that flower-growing in winter is done better in the neighborhood of New York than in England. Probably the advantage you have in drier, brighter winter-weather will account for this. Cut flowers are very abundant here this Christmas.

FREESIAS.—These beautiful cape-bulbs are amongst the very best of the newer additions to winter-flowering green-house

plants. It is only about five years since they were brought into notice, and now they are in almost every garden. But their cultivation is not yet properly understood, save by a few. They are as easily managed as Roman Hyacinths; but one point of special importance must be observed. This is, the plants ought to be kept growing all the year round, not rested, as is the usual practice. The best plants in flower now have spikes two feet high, with from four to seven branches and many large, pure white, deliciously fragrant flowers. These have not been rested since they flowered last year, but kept watered and shifted into a size larger pot in May. Bulbs which were dried off and rested dry have not produced nearly such fine spikes. It is true that at the Cape, where Freesias are native, they undergo a long period of drought and enforced rest, but nature is not always the best guide in regard to the cultivation of other plants besides Freesias. There is only one really first-rate kind, and that is the one known as *F. refracta-alba*. All the known kinds are varieties of one, or at most two, species.

LACHENALIAS.—The first species to flower here is *L. pendula*, and, taken altogether, this is the best of all. It blooms early, lasts a long time, the flowers are the largest, most numerous on the spike, and their colors are attractive. The species varies somewhat, the best form having erect spikes, fifteen inches long, with from thirty to forty flowers on a spike, each flower one and a half inches long, of good width and substance, and colored vermilion, marked and tinted with sea-green and purple. *L. quadricolor* (syn. *L. tigrina-Warei* and *L. superba*) is also in bloom. It is a variety of the old and common *L. tricolor*, which every one grows, or should grow, and of which we have several other distinct and pretty varieties. This has erect spikes nearly a foot long, with from ten to fifteen nodding flowers, each one inch long; the sepals, yellow tipped with emerald green, half as long as the petals, which are greenish-yellow, banded at the apex with brown-purple. Well grown plants of these two Lachenalias make a fresh and pretty display in December and January. The genus is limited to the Cape, where there are about thirty species. They are commonly known as Cape Hyacinths. If not already well known in American gardens, they deserve to become so. We grow large quantities of most of those above named for the conservatory in winter and early spring.

SKIMMIA FOREMANNI.—A group of small, bushy plants, grown in pots and covered with berries, was exhibited at the last meeting of the Royal Horticultural Society under this name. The berries were in large clusters, as in the Holly, about the size of small peas and shining coral-red in color. The plants were very ornamental, and exactly of that character which is certain to prove valuable for Christmas decorations. Mr. Foremann, nurseryman, of Eskbank, Dalkeith, professes to have obtained them by crossing *S. fragrans* and *S. oblata*, but they look rather like a seedling sport from the well-known *S. Japonica*, though they promise to be much more useful in the garden than even that good old plant. Mr. Foremann states that the berries remain on the plants eighteen months or two years.

CYDONIA MOERLOOSEI is a new variety of *C. Japonica* recently obtained by Messrs. Veitch, and till lately flowering in their nursery at Coombe Wood. In a mild winter it is usual for *C. Japonica* to develop a few straggling flowers; it has done so somewhat freely this month. But *C. Moerloosei* was covered with bloom and buds in mid-December, so that if the mild weather continues it will be in full bloom at Christmas. This free-flowering plant would probably be worth growing in pots for the supply of cut bloom in mid-winter. The flowers are scarlet, and larger than in the type. Apparently there is another variety, with white and carmine flowers, under the name of *C. Moerloosei*, in continental gardens.

BOUVARDIAS.—I am told that these plants are grown a great deal better in America than we can hope to grow them here, owing, no doubt, to your bright winter sun. In England no one grows them better than the Messrs. Low, of Clapton, where I saw half a dozen enormous houses full of them, all either in full bloom or in bud. The single-flowered varieties are beautiful, President Cleveland being perhaps best of all. But the doubled-flowered kinds are ugly, stiff, ungainly, bearing the stamp of monster on every petal. I believe they all originated in America. Would it be asking too much if one requested your Bouvardia raisers to burn all the double sports they get and limit their efforts to singled-flowered varieties? Many double flowers are ugly; double Bouvardias are especially so.

CHRISTMAS ROSES are in glorious perfection in sheltered borders out-of-doors here. Some of the clumps bear each fifty or more flowers, all expanded, pure white or rose-tinted, and promising to remain in beauty for weeks if the fog will only permit them.

PLATYCLINIS.—These plants are better known by the garden name of Dendrochilum. Several species are flowering at Kew, the two best being *P. Cobbiana* and *P. uncata*. I suppose these plants are well known in America, and I only notice them here for the purpose of stating a fact which may not be known to all growers, in regard to the temperature they like best. Until about three years ago we grew them in our East India house, treating them as distinctly tropical Orchids. They throve under such treatment for a time, and then weakened, becoming spotted and sickly. On removing them to the Cattleya house they improved, and have continued to do well and flower freely every winter since.

MAXILLARIA GRANDIFLORA is the best of those species which thrive in a cool house. It is much superior to *M. venusta*, its nearest affinity, the leaves being less apt to spot and the flowers better in shape and more upright. Each flower is elevated on a peduncle six inches long and is nearly four inches across, pure white, save the soft yellow of the front lobe of the labellum and the tinge of rose on its two side lobes. The flowers are fragrant and remain fresh at least a month.

BROMELIADS.—There is a very large collection of these plants at Kew, some of which are always in bloom. The order is not popular in England, a few only, such as *Tillandsia Lindeni*, being recognized by horticulturists here. In Continental gardens these plants are as popular as Orchids are here. The late Professor Morren had a large range of houses filled with all kinds of Bromeliads, which made a glorious display of a very interesting and exceptional kind at all seasons. Such fine genera as Billbergia, Vriesia, Æchmea and Pitcairnea are now represented by flowering examples at Kew, where, singularly enough, they are as much admired by visitors as the best of Orchids.

December 21st, 1888. *W. Watson.*

New or Little Known Plants.

An Addition to the Trees of Florida.

IT is only after a good deal of hesitation and a careful examination of the material which illustrates the American species in the herbaria at Kew, Paris and Berlin, that I venture to propose a new species in the large and very difficult tropical genus Eugenia for a Florida tree which none of the described species with axillary inflorescence at all resembles.

*Eugenia Garberi, nov. spec.,** which is figured upon page 29 of the present issue, is, in Florida, a tree fifty to sixty feet high, with a straight trunk, eighteen to twenty inches in diameter, covered with thin, bright red bark, separating freely into thin, flaky scales; the branches are rather stout, upright and covered with reddish bark; the branchlets are round, very slender and ashy gray. The leaves are an inch and a half to two inches long, and a half to nearly three-quarters of an inch wide; they are ovate-oblong, acute, or more rarely somewhat rounded at the base, and gradually contracted at the other end into a long, obtuse point; the margins are revolute and thickened. The leaves are very coriaceous, dark green and glandular-punctate on the lower surface; the mid-rib is prominent, and the primary veins are connected near the margins, and form a conspicuous line nearly parallel with them. They are borne on stout petioles one-third to nearly one-half an inch long. The flowers, which appear in September, are small, hardly more than an eighth of an inch across when fully expanded, with short, rounded, obtuse sepals and nearly round white petals. They are produced in several-flowered axillary umbels upon glabrous, slender pedicels, which about equal the peduncles in length, and have two minute, acuminate, deciduous bracts just below the flowers. The ovary is two-celled, with numerous ovules. The fruit, which matures in March and April, is

* EUGENIA GARBERI, nov. spec.; arbor mediocris; ramulis novellis teretiusculis, glabris; foliis petiolatis, ovato-oblongis, obtuse longiuscule acuminatis, basi acutis, vel sub-rotundatis, glabris, rigide coriaciis, margine revoluto, subtus minute punctato-glandulosis, nervis mediis supra vix impressis, subtus prominentis, venis tenuibus, arcuatim limbinervis, utrinque reticulatis; pedicillis glabris, umbellatis, axillaribus, 1-floris, sub. flore bibracteatis, folio 4-5-plo brevioribus; sepalis 4, ovatis, membranaceis; petalis subrotundatis; ovariis, biloculares, loculis multi-ovulis; bacca calyce coronatis, sub-globosis vel obovatis, longe-pedunculatis, 1-spermis, coccineis.

Habitat in silvis Floridæ australis, et in insulis New Providence et Antigua.

E. FOCKEA, Sargent, Reports Tenth Census United States, IX., 89, in parte.

round or obovate, a quarter to a third of an inch in diameter, crowned with the calyx-lobes, one-seeded, and bright scarlet when fully ripe. The wood is very heavy, exceedingly hard, very strong, close-grained and compact; bright orange-brown, with somewhat darker sap-wood. This tree grows very slowly, the specimen in the Jesup collection in the American Museum of Natural History (now labeled *E. procera*) is but twelve and a half inches in diameter, and shows 155 rings of annual growth, with fifty-one rings of sap-wood.

Eugenia Garberi occupies a rich hummock or low island, raised somewhat above the level, sandy, Pine-covered plain which separates Bay Biscayne, in the extreme southeastern part of Florida, from the Atlantic Ocean, and situated about three-quarters of a mile east of the mouth of the Miami River, and close to the shores of the bay (*Garber* (1877) in flower; *Curtiss, Sargent*). It is the most common, and, with its bright red bark and lustrous foliage, by far the most conspicuous object in this particular spot, which is one of the most interesting in the United States for the student of trees; for here, and in no other place with which I am acquainted, are seen trees of the typical North American flora mingling freely with tropical West Indian species. Here, in an area of a few acres, besides this Eugenia, are found the Live Oak of very large size, the Red Mulberry, the Palmetto, the Pine (*Pinus Cubensis*), the Mastic (*Sideroxylon Masticodendron*), the Gumbo Limbo (*Bursera gummifera*), the Iron-wood (*Condalia ferrea*), the Marlberry (*Ardisia Pickeringia*), the Bustic (*Dipholis salicifolia*), the Calabash (*Crescentia cucurbitina*), the Pigeon Plum (*Coccoloba Floridana*), the Lance-wood (*Nectandra Willdenoviana*) here replacing the more northern Sassafras; while the margin of the bay, a few hundred feet away, is lined with the Red Mangrove (Rhizophora), the familiar inhabitant of tropical shores, and here attaining in the United States its greatest size.

Eugenia Garberi has been detected also by Curtiss upon Old Rhodes and Elliott's Keys, two of the Florida reef-keys west of Bay Biscayne. It was collected by Brace upon the Island of New Providence in 1878 (Herb. Kew., without flowers and fruit), and by Dr. Nicholson, in Antigua (Herb. Kew., without flowers and fruit and without date).

It is by far the largest, as well as the most beautiful, of the species which occur in Florida, and may commemorate fitly the botanical services of the late Dr. A. P. Garber, of Pennsylvania, who, so far as I have been able to learn, was the first botanist who visited Bay Biscayne, and who was the discoverer of this species, which has heretofore been confounded in herbaria with *E. procera* of Poiret, a very different and much smaller plant, with smooth, gray bark, and thinner and less coriaceous leaves, larger flowers on longer pedicels, appearing in May, and large, black fruit, which ripens in November.

Fig. 87.—Eugenia Garberi.—The flower and fruit much enlarged.—See page 28.

Six species of Eugenia are known in Florida. They are all trees, with the exception of *E. longipes*, Berg., a Cuban species, discovered upon No Name Key by Mr. A. H. Curtiss a few years ago, and not seen elsewhere within the territory of the United States. It is a low branching shrub, growing in an open forest of *Pinus Cubensis* and *Thrinax argentea*. The other Florida species (*E. buxifolia, E. dichotoma, E. monticola* and *E. procera*) are,

with the exception of the second, all common upon Key West, where they form, especially *E. buxifolia*, a large part of the forest scrub, and have been known as North American plants for half a century, or since their discovery on the Florida Keys by Dr. J. L. Blodget, who first made the botany of this region known.

The Eugenias are members of the Myrtle family. No less than 750 species have been described by botanists, of which nearly two-thirds are found in tropical and subtropical America. The genus, however, is widely and quite generally distributed through the warmer parts of the two hemispheres. Several of the species produce valuable fruit. The most important is *E. Pimenta*, which produces the allspice of commerce, and is largely cultivated in some of the West Indian Islands, especially in Jamaica. The well-known Jabuticaba fruit of Brazil is produced by *E. cauliflora*, and the Rose Apples of the East are the fruit of *E. Malacensis* and *E. Jambos*. Several species are grown in tropical gardens for their handsome evergreen foliage and fragrant flowers. *C. S. S.*

Cultural Department.

Lachenalias.

THE Lachenalias are bulbous plants, natives of south Africa. Their flowers are all pretty and interesting; some are very beautiful and a few are fragrant. They deserve to be better known and more widely cultivated than they are.

Their needs are few and easily provided for. Briefly stated, their requirements are: (1) A season of complete rest in the summer, when the bulbs may be left in the pot where they grew, or, better, may be taken out of the earth and put away in boxes or bags; (2) a good supply of water and a moderate heat in their growing season; and (3) an open soil. Their culture being so easy and their habit of growth very neat and compact, and their spike of flowers so sure to appear, they are excellent for window-gardening as well as for more extensive planting in green-houses or frames.

I propose in this paper to name all the species of the genus, giving notes and descriptions of the kinds I have grown, with some account of a few of the varieties which occur in a natural state. Of hybrids there are as yet very few. Neither *L. Nelsoni* nor *L. Cami* is an improvement upon the best forms of *L. tricolor*, from which both are descended. I have not yet flowered the series of hybrids offered by Dammann & Co., nor do I expect to be very much pleased with them, for the pendulous-flowered species are not the most promising.

Lachenalia pendula is an exceedingly beautiful species. Its flowers are of a bright coral color; the three inner segments—which, as in all the species, form a tube inside of the three shorter outside ones—are tipped with deep purple and green. This species is the earliest of all to blossom. If its bulbs are potted, as they should be, about September 10th, they will be in blossom by the end of November. Although so showy, *L. pendula* does not depend upon insect-fertilization, but forms fertile seed abundantly, being the only species, so far as I know, which does this. Bulbs purchased under the name of *L. pendula* very often prove to be *L. tricolor*.

The last named species, though very pretty, is inferior to *L. pendula*. It is of weaker growth, and its flowers are much smaller, being usually not over seven-eighths of an inch long. The colors are deep yellow as a ground, with green on the tips of all six segments and deep red at the base of the flower. As the flower grows older the red and green fade, and the yellow alone remains.

L. tricolor has two varieties, which are almost, if not quite, equal in beauty to *L. pendula*. These are var. *luteola*, which is twice as large in flower as the type, and much superior in color, which is a full, deep golden yellow, and var. *quadricolor*, a magnificent kind, whose colors are crimson, deep yellow, emerald green and violet in about equal proportions. Both of these varieties are larger than the type in all their parts, and increase by offsets much more rapidly; they have the same beautifully spotted leaves. The variety quadricolor is often sold under the names of superba and versicolor.

L. rubida is rarely found under its true name in catalogues, but is usually offered as *L. contaminata*, a widely different plant. A few years ago I bought as *L. rubida* and *L. stolonifera* two bulbs which I found would not blossom under ordinary conditions, though they multiplied rapidly. Tired of the vain attempt, I planted them out-of-doors and let them take their chance. The next spring they came up, much to my surprise, and grew vigorously, but did not flower. I spoke of the hardiness of these Cape bulbs to several persons, who were as much surprised as I had been. A few weeks ago a note appeared in an English paper to the effect that the writer had persuaded both of these to blossom, and found that they were identical, and not Lachenalias at all, but Scillas. Since then I have had the true *L. rubida* (there is no *L. stolonifera*). It is a very pretty kind, with broad leaves, faintly marked with dark green. Its flowers are eight to ten in number, an inch and a quarter long, deep pink, spotted and freckled with other shapes of the same color. It is Jacquin's *L. tigrina*.

L. contaminata has four or five long, narrow leaves, and a flower-stalk thickly set with greenish-white flowers, with brownish-purple-tipped segments and conspicuous green seed-vessel. The position of the flowers is as nearly erect as their crowded condition will allow. The flowers are not showy, but they have the merit of fragrance. It is sometimes sold as *L. orchioides*, but the true *L. orchioides* is very different.

L. orthopetela has from twenty to thirty white flowers, somewhat tinged outside with purple, and not very showy.

L. orchioides is very variable, and not easy to get in any form. The one I have shows numerous yellow, red-tipped flowers, purple in the bud, and very fragrant. Plate 854 of the *Botanical Magaziue* represents a far less showy variety, having the outer segments green and the inner dark purple.

L. glaucina is exceedingly variable, and highly ornamental in all of its forms. Andrews (*Botanical Repository*, *t.* 460) gives, under the name of *L. sessiliflora*, a bright rose-pink variety of this species, and the *Botanical Magazine* (*t.* 3552) gives one almost white, tinged with purple and spotted with blue. The form I have is, I think, the most beautiful of all Lachenalias. Its leaves and flower-stems are strongly and thickly mottled with chocolate-purple. The flowers are about twenty-five in number, violet and indigo in bud, becoming, when open, the color of a robin's-egg, with white or flesh-colored tips, and shading off in sea-green. They are about an inch in length, and incline upward. This is sometimes sold as *L. reflexa*; sometimes as *Cœlanthus complicatus*.

L. pallida, sold sometimes as *L. cærulescens*, is exceedingly beautiful, being, in its best form, light blue, with one inner segment much expanded like a lip and marked with lemon-yellow. Another inferior form has outer segments dark blue and inner ones light green. There are one or two other forms which I have not seen.

L. unifolia has a single rolled-up leaf, expanding, however, as it rises, the lower part of which is mottled and lined with crimson and gray, like a water-snake. The flowers are short and broad, much like the Lily-of-the-Valley. The outer segments are blue, running to red; the inner, white and green.

L. isopetala is very handsome in its best form, having bright rosy flowers an inch long. Another variety is so inferior as not to be worth describing. I see no reason for its name.

L. pustulata has erect flowers of small size, light green and very fragrant. The leaves are curiously blistered.

L. anguinea has most singular leaves, so strongly blotched with light green on a dark-green ground, as to resemble a snake. The flowers are whitish and not attractive.

L. lucida has nothing of horticultural interest except the perfume of its flowers, and even that has a somewhat disagreeable sweetness. I have grown it for many years as *L. fragrans*, under which name it is sometimes sold.

L. racemosa has postulate leaves, and flowers which are placed horizontally on the stem, whose three inner segments are white, tipped with purple, and whose outer are much shorter, white, tipped with olive. About thirty are borne on a stem, and are somewhat fragrant.

L. purpureo-cærulea has blue and dull red flowers and blistered leaves. It is not very attractive.

L. reflexa (syn. *Cœlanthus complicatus*) is the least showy of all I have seen. The flowers are very small and few, greenish-yellow, marked with dull red.

The following species constitute the remainder of the genus. I have some of them, but they have not yet blossomed, and I cannot describe them: *L. patula, liliiflora, carnosa, Zeyheri, convallarioides, hirta, Cooperi, juncifolia, versicolor, violacea, nervosa, Bowieana, bifolia.*

Canton, Massachusetts. *W. E. Endicott,*

The *Arctostaphylos Uva-ursi* seems a much neglected evergreen. I passed a clump of it to-day that covered a space of six square feet. Planted in light, sandy soil, it is exactly suited, and soon spreads so that the ground is completely covered. At this season of the year its shining leaves are of a dark chocolate color above and redder beneath. There are many positions which it would fill well.

Germantown, Pa. *Joseph Meehan.*

New Chrysanthemums.

DR. WALCOTT'S article in the issue of December 29th must have interested all Chrysanthemum growers. As he has stated, new offerings have been so numerous lately (S. Delaux alone putting out 100 in 1887), that no one grower has been able to test them all. As I have had strong slips of the most promising foreign varieties, I can add a few names to those given. Of recent French varieties, Madame Baco is distinct—a rose colored Mrs. Bullock. Of Delaux's list for 1887, William Cobbett (salmon, with a violet cast) is a first-rate addition to the October flowering varieties. Royal Aquarium (white, with violet tips) is good for the same season. With the numerous early varieties one can now have, if desired, a show of large flowers from early September onward. Of the general list, Mr. Garnar (canary and bronze), Arthur Payne (deep red), Charles Waggstaff (fine white) and Mina (white, striped with pink) have proved best with me. Duke of Berwick has met with most success, but with me its beauty is doubtful. Among others of the same list, perhaps Samuel Morley (red, early), Hogarth, Priscilla and Madame Payne may develop better on a second trial. Lord Mayor I shall try again on Dr. Walcott's recommendation. Le Reveil is a very large quilled ball, of no great beauty. Of Cannell's Japanese collection, Mr. H. Cannell seems to me only fit for exhibition boards. Lady Lawrence is R. Bottomley repeated. There seems some confusion as to Mrs. Cannell, several different plants having been sent here so named. Edward Molyneux is easily first of this list. Of English kinds, mostly sports, I can recommend Mr. Charles Gibson (bronze, sport of Mrs. N. Davis); Miss Annie Lowe (primrose, sport of Lady Margaret), a very fine and lovely flower; Carew Underwood (bronze, sport of Baron Prailly), a very large and light flower, remarkably fine; Ralph Brockelbank (yellow sport of Meg Merrillies), identical with the original in form and size; William Stevens (orange, shaded red).

Ed. Audiguier has distinct flowers, but bluish-red. To the list of American importations may be added The Bride—a first-rate white. (Is this Avalanche?) Has any one found any prizes among the American seedlings of 1888? Many of the prize kinds failed to give me any results from the forced slips sent out, while of numerous kinds under trial, E. Oakley (Spaulding) is the only one to be saved—it is a medium-sized flower of the clearest, brightest light chrome. J. Thorpe (Spaulding) is marked for a discard, its blue-red not being counterbalanced by enough good qualities. Judging from appearances, we shall have the best lot of American seedlings in 1889 ever sent out. The plant of Mrs. A. Carnegie, shown in New York, scarcely allows a doubt that this is a very valuable variety for general culture; for exhibition its merits were well shown in a few specimens. It seems to be a decided step toward a dark, wide-petaled, self-colored flower.

The market value of novel Chrysanthemums has evidently not yet reached its limit, since M. Delaux holds a small stock of a new variety at 10,000 francs. The interest in Chrysanthemums, too, is extending, and a national society, with a committee to which new flowers could be referred for endorsement, would be a help to amateurs and the trade as well. Too many new varieties are now offered at high prices with the simple endorsement of the raiser, no doubt in most cases given in perfect honesty, for every one who has raised seedlings will understand how difficult it is to take an unbiased view of one's own productions.

Elizabeth, N. J. *J. N. Gerard.*

A Japanese Stable.—See page 26.

Orchid Notes.

Cattleya Trianæ.—This magnificent winter flowering Cattleya has now commenced to enrich our Orchid houses with its large and very handsome blossoms. A great treat is in store for those who may visit the collections of Messrs. Kimball, Corning, Ames and others, where these plants are to be seen rapidly developing their enormous flowers, which are remarkable for great variation and brilliancy of color. At a recent visit to Mr. De Forest's Orchid houses at Summit, New Jersey, this Cattleya was seen by the thousand, abundantly furnished with foliage and literally covered with flower sheaths. Some flowers were already expanded, having labellums of a fine magenta purple, and exquisitely fringed. Besides this variety, there were hundreds of *C. Mossiæ*, *C. Bowringeana*, *C. Percivaliana*, *C. Gaskelliana* and many other free flowering varieties. It is safe to assert that the possessor of this vast number of plants is the largest Cattleya-grower in the country. As a florist's flower, *C. Trianæ* is fast becoming popular, as it blooms at a season when flowers are in great demand, and its easy culture, with the abundance and lasting quality of its flowers, make it a specially desirable Orchid. During the months of March and April importations of this species generally arrive. They are then in a dormant condition, and this will also be found a very convenient season to commence establishing them, as the spring and summer months enable the plants to make strong and satisfactory growth. They enjoy a mixture of rough fibrous peat, clean sphagnum in small quantities, with charcoal added, which last is a sure preventive of stagnant compost. When making their growth full sunlight should be kept from them carefully, as the foliage is not so robust as that of *C. El-Dorado*, *C. speciosissima*, *C. Walkeriana*, and such varieties. All thin-leaved Cattleyas, such as *C. Mendelii*, *C. Chocoensis*, *C. Gaskelliana*, *C. Percivaliana*, would grow as well if not fully exposed to direct sunlight, as good, sturdy growths and bold, substantial blossoms are easily obtained by giving the plants a thorough rest after flowering, and an abundant supply of pure air and moisture during their growing period.

A. D.

Principles of Physiological Botany as Applied to Horticulture and Forestry.

III.—The Absorption of Liquids by Plants—The Transfer of Water from the Soil to the Roots.

THAT plants have in their composition a large proportion of water is a very familiar fact. The amount of water differs in different kinds of plants, in different parts of the same plant, and, as has been repeatedly shown by experiment, in the same part at different seasons. Illustrations of these differences will occur to every one upon reflection, and do not require to be further examined at this time. But, back of these differences lies a fact that a certain percentage of water in plants is essential to their activity. When this amount is diminished below a certain point the activity of the plant is diminished, and, if the lack is long-continued, the life of the plant is imperiled. The first case is well illustrated by the slow ripening of seeds, the latter is too often illustrated in times of drought.

Part of the water in the plant exists as liquid water in the sap of the active cells. In what are popularly called the pores of wood—namely, the microscopic tubular bodies known as ducts—produced by a peculiar development of coherent cells—it is rather uncommon to find any liquid water, although this does occur at times. The sides of the ducts are moist, and the whole wall seems to be saturated with water, but the cavities themselves do not generally contain any water at all. In these and similar cases it is believed that the water exists in a combined state so thoroughly incorporated with the substance of the walls of the long cells and ducts that it cannot be discerned as water. But it can be proved to exist there by the simple experiment of drying the whole. It is not, however, very clear in what way the water is combined with the cell-wall substance in plants. One theory, which has met with general recognition as capable of explaining a large number of facts, is that the water surrounds each structural molecule as a delicate film which is practically continuous with the films nearest to it, and thus all the water throughout the plant is a connected whole which, under normal conditions, is in a state of equilibrium very easily disturbed. Thus it can be disturbed by the evaporation of the films of water around the structural molecules in foliage, which makes a demand upon the supply of water below the point of loss, and so on down the whole stem, until the roots are reached, and here, of course, all further supply must come from the soil. This transfer can be easily examined in the case of our forest trees and shrubs after we have ascertained the manner in which the loss from evaporation can be made good by means of the roots. Under ordinary circumstances no water even in the state of vapor is absorbed by leaves.

Microscopic Structure of Roots.—The structure of roots can be most readily understood by confining our attention at first to the parts of the root which are near the end of the delicate root-branches. These parts may be considered in the order of their succession, beginning at the very tip. The extreme tip has, in the case of our common plants now under consideration, a well-marked cap of a protective nature, made up of somewhat flattened cells constituting a hollow cone, in the inner angle of which is a group of cells. Each of these cells is completely filled with protoplasm, and is actively engaged in the work of producing new cells; hence the group is conveniently known as the "growing point." New cells are formed in front and around this growing point, and these new cells, through changes in their size and shape, serve to extend the rootlet by terminal growth. Thus the minute rootlets are ever reaching forth into new soil, into the crevices of which they can, owing to their minute size, make their way. After they have crept into the interstices of the soil, they thicken up sooner or later, while far ahead of the thickening parts is the still advancing point of growth protected by its root-cap.

The tip of the root is not, however, a passive thing, merely pushed forward by something behind it; it possesses sensitiveness and the power of spontaneous motion. It is constantly revolving within a very narrow orbit. When it is in the soil, this motion is wholly obscured by the crowding of the particles of earth, nevertheless by this restricted motion in a cramped space, the tip can work along almost as if in search of a pathway. Moreover, the tip by its dull sensitiveness can distinguish between particles of soil which have different physical properties, and thus, one might say, choose its course. The description of the marvelous faculties possessed by the tip of the rootlet, as given in the "Power of Movement in Plants," is among the most interesting of the writings of the late Charles Darwin.

Root-Hairs and Other Absorbing Cells.*—It was formerly thought that the tip of the root, having, as appears under the microscope, a sort of spongy structure, is the efficient agent in soaking up moisture from the soil. But it is now well known that it is the cells which lie just behind the tip of the young rootlets which perform the work of absorption. These thin-walled cells on the surface of the rootlet, just behind its tip, are in most cases associated with peculiar cells which have slender outgrowths or prolongations like hairs, and these are sometimes so thickly crowded together that they give to the narrow zone the appearance of white or almost colorless velvet. The root-hairs are transient, working actively for a time, and then falling off, but the newer parts of the extending rootlets are continuously provided with fresh ones, and thus the supply of absorbing organs is constantly increasing just in proportion to the branching of roots and the formation of new rootlets, each of which is, of course, furnished with its zone of plant-hairs. And, furthermore, from the manner of growth, the new root-hairs are formed just where they can find fresh soil for their work of absorption, ever foraging through new fields.

The root-hairs come into most intimate contact with particles of soil, and undergo, in many if not most cases, a modification of their walls which may be said to glue them to the contiguous particles. It is probable, but not yet positively proved, that they exert a slight solvent action even upon some sorts of soil which appear to be otherwise practically insoluble in any aqueous solutions. As we shall later see, when we examine the action of the tip during the process of growth, there is always a slight excretion of an acid at the tip itself. Soil-water, as well as the water of our rivers and ponds, contains in solution small amounts of various mineral and other matters, and these in certain proportions are absorbed by the rootlets through the mechanism before described. The mineral substances are, for the most part, compounds of the following elements (chiefly with phosphoric and sulphuric acids, together with chlorine): Calcium, magnesium, potassium, iron, and others in smaller amount. Besides these, certain compounds of nitrogen are absorbed. The origin and destination of all these substances will be discussed when we take up the subject of nutrition.

Osmose.—Absorption of liquids takes place through the activity of the superficial portion of the thin layer of proto-

*Another possible manner in which roots may absorb will be taken up for consideration in a subsequent paper of this series.

plasm which lines the newer cells just back of the tip of the rootlets. When two liquids which can diffuse through one another are separated by a membrane which the two liquids can moisten, diffusion goes on rather more rapidly than if no membrane were interposed. The process is termed osmose. But in the case of such a membrane as parchment and those formerly used in experiments, it was found that there was always an outgoing current to replace the incoming one, and that these currents, if one can call them such, had certain relations of equivalence to each other. Now, as there is no true compensatory outward current in the case of absorption by root-hairs, it was beginning to be felt that the theory of osmose, as formerly understood, was inadequate to explain the taking up of matters from the soil. Professor Pfeffer has shown within a few years that in some artificial membranes, which are very nearly like those of the root-hairs, there is for a time a process of repair going on, by which the activity of the artificial membranes is constantly renewed, and in such cases, just as in that of the root-hairs, there is no compensatory outward current to be observed. Thus strengthened by Pfeffer's contributions, the theory of osmose has again taken its place as sufficient to explain the process of root-absorption, or, rather, speaking more generally, the absorption of liquids by any active cells. It is as yet impossible to understand clearly the ultimate nature of the force at work in osmose. We know that it is correlated with certain molecular activities, such as electricity, and that its principal seat in plants is in the surface of the film of protoplasm which lines living vegetable cells. We know also that it is related to imbibition and to capillarity, as these are manifested in non-living matter. Furthermore, we know that the capacity of the protoplasmic matter in cells, for the repair by which osmose can alone be continued, is limited in some cells sooner than in others; but why the chemical changes underlying repair should cease in root-hairs sooner than in some other cells of the plant, is, thus far, beyond the reach of experiment. We know, however, that when the power of osmose fails in the root-hairs or in the cells near these, the work of absorption is taken up by others which are freshly formed, and these new ones are, in their turn, soon replaced by others. In every case the new ones are produced in new soil, where fresh materials can be obtained.

George Lincoln Goodale.

Cambridge, Mass.

The Forest.

The Forests and Woodlands of New Jersey.—I.

THE following is the first part of a report on the forests and woodlands of New Jersey which has been prepared for the final Report of the Geological Survey of that State by J. B. Harrison, Secretary of the American Forestry Congress. Advance sheets have been kindly furnished to GARDEN AND FOREST by Professor George H. Cook, Director of the Survey.

The area of the woodlands in New Jersey is about 41.5 per cent. of the surface of the state. This area is slowly diminishing, but the diminution has been but slight during recent years. In the mountain regions of the northern part of the state, some small fields that were once cleared and cultivated are relapsing into forest. Seedling trees are encroaching upon them from all sides, and the woods are re-establishing themselves in their ancient dominion. There are instances of the same thing in southern New Jersey; but they are few and unimportant, and in the whole state the area of land once cultivated which is being again surrendered to forest growth is very small.

Wherever the soil is worth cultivating, on the plains and in the river-valleys, and even on the hills in the limestone lands of the northern part of the state, a little more of the remaining woodland is cut off and cleared up each year. In the Pine country of southern New Jersey some considerable tracts have been cleared for farming purposes within a few years.

Considering that the state has been settled so long, the proportion of forest land is very large. The soil varies greatly in quality. In the limestone regions and in the river-valleys in the northern part of the state, much of it is very fertile, and the growth of the trees is rapid, while on the granite and slate lands the soil is thin and poor, and the trees grow much more slowly. On a few small tracts there is so little soil, that when the forest is once cut off it does not reproduce itself. That is, the new growth is so scant and scrubby that it has no value as timber. But over the whole state, with this very slight exception, the forest grows again after it has been cut off, the deciduous or hardwood trees sprouting up from the stumps and the evergreens coming again from the seed.

The time required to reproduce the forest after it is cut off varies according to the differences of soil and the habit or character of different kinds of trees. In the fertile lands of Salem County, and in other parts of the state, trees will continue growing, and the value of a tract of woodland will go on increasing for a hundred years or more. But in some parts of the forest about Ringwood, and in other portions of the mountain region of northern New Jersey, the trees reach their culmination, or condition of greatest value, within twenty-five years after the former growth has been cut off, and it is then best to cut them again. Some tracts which have been standing for thirty-five years are no better now, the owners say, than they were ten years ago.

When the perpetuation of the forest is desired, it is best to cut it off a little before the trees reach maturity, as the succeeding coppice growth after young trees have been cut off is much more vigorous and rapid than the process of reproduction after an old or mature forest has been removed. Each new growth of timber is apt to be somewhat different from the one which it succeeds. Some kinds of trees sprout from the stump more vigorously than others. Chestnut, for instance, usually sends up a greater number of sprouts than any other kind of timber which grows in the region under consideration, and cutting off a forest composed of Chestnut, Hickory, Ash, Oak and other kinds of trees will often increase the relative number of Chestnut trees.

FOREST PRODUCTS.—The chief products of the forests or woodlands of New Jersey are lumber, shingles and other building materials, timber for bridges and ships, wagons and carriages, telegraph poles, railroad ties, posts and fencing materials, staves and heads for barrels, tubs and pails, hoop-poles, and handles for axes, agricultural implements and umbrella-sticks. Baskets, wooden ladles and spoons and spools are sometimes manufactured in the state, and wood-pulp to be used in the manufacture of paper is made in small quantities. The use of wood for fuel is general though not universal in the state, and charcoal is made in some places.

As is well known, large quantities of White Cedar timber were formerly "mined," or taken from underground, in swamps in the southern part of the state, but in most of these the available supply is nearly exhausted, what remains being mostly too far underground to admit of its being raised and manufactured with profit, though logs are still sometimes taken out. The same industry was formerly carried on in some of the northern swamps, though less extensively than in the south, and logs are even now occasionally raised in the north for materials for tubs and pails. Dense swamps of Tamarack (*Larix Americana*) were formerly a prominent feature of the forests in some parts of northern New Jersey, but they have nearly all been cut off, and the Larch does not appear to have reproduced itself to any great extent.

In some parts of the state many Christmas trees are cut for the markets of the towns and cities, and the boughs of the Holly, with its bright green and unfading leaves and its beautiful red berries, are gathered in large quantities in the month of December and sold in Philadelphia and perhaps in other places. In the spring and summer there is a very considerable traffic in wild flowers and plants of various kinds from the woodlands of the state. Great quantities of Water Lilies and Azaleas are sold, with the Trailing Arbutus, Iris, Wild Violets, *Xerophyllum asphodeloides*, *Helonias bullata*, *Pyxidanthera barbulata*, *Arethusa bulbosa*, the Pogonias and Calopogons, Clethra, Swamp Magnolia and other flowers.

The oil of sassafras is sometimes distilled in places in the southern part of the state, where also quercitron, a preparation of Black Oak bark, for dyeing purposes, was formerly made in considerable quantities. This latter industry appears to have been relinquished several years ago.

ORIGINAL FOREST.—There is not much really original or primeval forest left standing in New Jersey. That is, there are few, if any, large tracts of forest that have not been cut off at some time since the settlement of the state by white men. There is a small piece of White Oak woods on the farm of Mr. Thomas Lawrence, near Hamburg, in Sussex County, which has never been cut. These trees cover a remarkable hill, or long, narrow ridge, which rises eighty or a hundred feet above the fertile valley of the Wallkill River, and one would have to travel far to find a more interesting or attractive grove. Though they stand very near to the busy haunts of men, the great trees are populous with gray squirrels, who appear to have learned to feel entirely comfortable and secure among them.

Correspondence.

Rare Trees of Rhode Island.

To the Editor of Garden and Forest:

Sir.—There are very few acres of undisturbed forest land in Rhode Island. Most of the land now devoted to wood-growing has been subjected to one, two, or more choppings, either by culling the best trees or by clean cutting. Yet, while this general deforestation has been going on, many single trees and groups have been spared, some of which have attained a large growth and a fine development of shape. Such trees are now not only objects of beauty in themselves, but add greatly to the pleasing scenic effects of the grounds where they grow. The location of the state with reference to ocean currents, and its greatly varied surface and soil, afford favorable conditions for a larger number of tree species than are usually found in such a small territory. Certain localities show a mingling of two quite distinct floras, and this is seen in the tree growth as well as in smaller plant life. Among trees, I will refer to a few species which, although rare and local in the state, flourish well when found.

The Swamp Spanish Oak or Pin Oak (*Quercus palustris*) is found along streams and in low grounds in the southern part of the state. I have been unable to find any record of the natural growth of this Oak anywhere else so far east. Of the eleven or twelve species of Oak indigenous to this state, this is the most free and graceful in its habit of growth, and one of the most ornamental in its general appearance. In open ground it has a symmetrical, rounded head, without the stiffness of most of the Oaks. Its limbs, slender for an Oak, divide into spray-like branchlets, bearing deep-cut, wide-spreading, shining leaves, giving the tree a cheerful aspect. Overhanging a stream or pool, it assumes a somewhat one-sided, drooping habit, the branches often touching the water. This tree is found, here and there, on the borders of the Great Kingstown Swamp and on the margins of the Pawcatuck River.

Another species decidedly local in the state is the Post Oak or Box White Oak (*Quercus obtusiloba*). The only specimens of this Oak, so far reported in this state, are growing near the shore of the most northern arm of Wickford Harbor, North Kingstown. There are trees there of this kind, in the edge of a wood-lot, which are fifty or sixty feet high; but in the open ground they form low, wide-spreading heads, the limbs bending downwards, with the lower ones actually resting upon the ground. The obtuse-lobed, glossy leaves, overlapping each other from branch to branch, form a living thatch of notable beauty.

The Tulip-tree (*Liriodendron tulipifera*), although only local in the state, is found in groups in several of the towns in the central and south-western parts. It grows to fine proportions, and is occasionally planted as an ornamental tree.

The Black Walnut (*Juglans nigra*) has been reported as indigenous to the state, but this is doubtful. But trees of this species have grown to stately proportions around some of the old homesteads, and young trees are now in thrifty condition where they may have been self-planted.

The Persimmon (*Diospyros Virginiana*) has been growing in a locality where it is highly improbable that any white man planted it. It may have been introduced by the Indians and have become naturalized. A Persimmon, which was standing some years since, measured three feet eleven inches girth at base, and three feet at seven feet up, and tapered gradually to a height of more than forty feet. This tree is now dead.

I will close by reference to some noteworthy Sassafras trees. A tree of this species of remarkable size stands upon the Spring Brook Farm, in Cranston, two or three miles from Providence. It is in a field of several acres, which has been cultivated for more than a century. It was probably saved on account of its size and beauty. A careful measurement, six years ago, gave the following results: Girth, near the ground, fourteen feet three inches; two feet up, eleven feet ten and one-half inches, with little diminution in its size to the limbs, eleven feet up. The height, computed by ratio from its shadow, was forty-nine and one-half feet. The tree has lost some limbs and shows other signs of great age; but its massive trunk, with its deeply furrowed bark, is still unbroken. It is a grand old sentinel, that has put forth its jaunty blossoms at more than a hundred seed times, and dropped its beautiful leaves at more than a hundred harvests, in the ground over which it has watched.

A group—or, rather, an irregular row—of trees of this kind, numbering over sixty, stands by the side of a stone wall near by, probably the progeny of the patriarch tree in the field. The estimated average diameter of three trees, two feet from the ground, is eight inches, and their height thirty feet. There is another notable group of these trees upon the peninsula known as Bullock's Point, a few miles below Providence, on Narragansett Bay. They grow among Cedars and Pitch Pines, but, from their spread and height, are evidently older than these. These trees number a dozen or more, and several of them are eight to ten feet in girth three feet from the ground and forty to fifty feet high.

The Sassafras tree is quite plentifully distributed throughout the state and many fine specimens may be seen by stone walls and in out-of-the-way places. *L. W. Russell.*

Providence, R. I.

[Mr. Russell's communication is of special interest, as it records, for the first time, the presence in Rhode Island of the Post Oak (*Quercus obtusiloba*), the Pin Oak (*Quercus palustris*) and the Tulip tree. The Post Oak had not been detected before in New England, except on the Islands of Martha's Vineyard and Naushon, in Massachusetts; and the Pin Oak was not known east of the valley of the Connecticut River, although a common tree along the Sound-coast in eastern Connecticut, and occurring sparingly near Amherst, Massachusetts. The Tulip tree has not been reported before east of western New England. The Persimmon has been supposed generally to have been introduced into Rhode Island in recent years, but, as it is found growing spontaneously in Connecticut, near the Sound, it is, perhaps, not improbable that it extends also into that state.—Ed.]

The American Mistletoe.

To the Editor of Garden and Forest:

Sir.—Referring to what is said of the Mistletoe in your article entitled "Christmas Green," in the issue of Garden and Forest for December 19th, permit me to say that this plant is found only in a few scattered localities in southern New Jersey, though within the memory of some persons it was occasionally found on the yellow-drift formation in the north-eastern part of the state. It is not now abundant in any true sense of the word in any part of southern New Jersey, with the possible exception of the region which may be called the head waters of the Great Egg-Harbor River, where within a radius of say ten or twelve miles I have counted over forty trees, large and small, with from one to twenty-five bunches of Mistletoe upon each of them. There is not enough of it, even here, to permit of its being gathered, except to supply herbariums with specimens from New Jersey. The localities are usually too far separated, and too much concealed in the swamps, to tempt even the cupidity of those who make the gathering of Christmas greens a business; and where it is known to exist it is usually too highly prized as a curiosity by people in the locality to permit of its being wantonly destroyed.

It is not likely that its extermination will be caused by its reputed medicinal virtues, but it is to be feared that if the Black Gum should become marketable, the Mistletoe would quickly disappear from this part of New Jersey; for in this region it grows only upon one kind of tree, the Black or Sour Gum (*Nyssa sylvatica*). C. F. Parker, however, found it growing at Jackson, Camden County, New Jersey, on the Red Maple, which fact establishes the possibility of its being found on other deciduous-leaved trees. But though I have carefully searched Apple trees and Swamp or Red Maples for it, I have never found it on them in this locality; and I do not think there is any record of its being detected upon any of the dozen or more varieties of Oaks found on the yellow drift in New Jersey.

Mays Landing, N. J. *John E. Peters.*

Shortia galacifolia.

To the Editor of Garden and Forest:

Sir.—In your interesting sketch of Shortia, published December 19th, you say that Mr. Hyams discovered, "with the aid of a correspondent, what a treasure he had."

As this whole discovery was under my eyes, I would like to say that to Mr. Joseph W. Congdon, then of Providence, now of Mariposa, California, the credit of the identification belongs. He came to my room and told me what he had found in Hyams' package, and had sent to Dr. Gray. An answer came from the latter, "If you think you have Shortia, send it on," or words to that effect. It was sent. Then came from Dr. Gray the characteristic postal, "It *is* so. Now let me sing my *nunc dimittis!*" I think this is worth preserving.

Providence, Rhode Island. *W. W. Bailey.*

Periodical Literature.

A pleasing article on "Shakespeare's Trees," by Mr. Arthur Gaye, may be read in the *Gentleman's Magazine* for December. Knowing how rich are the great poet's plays in allusions to flowers, it is somewhat of a surprise to find that he paid much scantier attention to trees. But, in the author's words, "though it would not be right to say that his 'tongues in trees' are among the most important, or even the most discriminating of his utterances, yet, regarded as a *parergon*, as so much extra matter 'thrown in' where there was already an infinity of subjects treated, they are deserving of notice and often of admiration." As we naturally expect, the Oak stands first on the list of native trees which Shakespeare celebrated, and is often referred to in a way which showed that he had a keen sense for its distinctive peculiarities of form, as well as a knowledge of the exceptional strength and toughness of its wood. But to the Elm, almost as conspicuous a tree in Britain as the Oak, "Shakespeare has not done justice." He mentions it only twice, and in both cases, oddly enough, in figures of speech which contrast its sturdiness with the clinging habits of the Ivy. And "for the Beeches, which share with the Oaks the chief forest honors of the land, he has no word of admiration or even of recognition. They are utterly ignored"; and this although "the tree lends itself with such facility to poetical language and from the days of *sub tegmine fagi* has always been in request," and although Shakespeare "must often have traversed Buckinghamshire, with its far-stretching beechen groves." The Ash is perhaps the fourth tree in importance on English soil; yet the Ash, too, is ignored by the poet, who makes use of the word but once, and then to denote a spear. So, also, with the Birch. Its name also comes only once, and then to figure a switch!

On the other hand, we find, with perhaps as much surprise, the Cedar of Lebanon, no living specimen of which existed in England in Shakespeare's day, is frequently referred to in his plays, not merely as a symbol of pride and beauty, but in descriptions which would lead us to imagine that it was a familiar object to his eyes. The Pine he often mentions, and the Yew, the Cypress and the Willow, while the Sycamore (by which we must understand the Sycamore Maple) comes in for an almost undue share of his attention. The same is the case with the Elder, which he mentions seven or eight times. The Olive, Laurel and Bay appear of course—how could a poet do without them?—and the Hawthorne, the Crab-tree, the Box-tree, the Holly and the Hazle, while the Alder is not mentioned and the Lime or Linden only once. The most charming part of Mr. Gaye's little essay is perhaps the first page, where he pays a graceful tribute to the Autocrat of the Breakfast Table, recalls his "rapturous love of trees," and regrets that we have never had from his hand a chapter on Shakesperian dendrology.

In the *Nineteenth Century* for December we find a sensible and interesting chapter on "The Fruit-growing Revival" in England, by Mr. Frank A. Morgan, editor of the *Horticultural Times*. Mr. Morgan does not give way to the exuberant prophecies which some writers, taking up Mr. Gladstone's now famous piece of advice, have voiced with regard to fruit growing as a panacea for all the agricultural woes of England; but neither does he take the pessimistic, discouraging tone which others have adopted in consequence of the many failures which have followed upon first attempts in a new direction. Having studied the matter carefully and intelligently, he decides that the industry is rapidly developing, that probably the next five years will see an enormous increase in the present area of orchard land; and that so long as £8,000,000 sterling are annually paid to foreigners for fruit and garden produce, there is no real ground for any apprehension of overproduction. But, he adds, while "it will pay to grow good produce, it will not pay to raise common goods. . . . The causes of failure in fruit growing may be summed up in two words—ignorance and indolence. It is practically impossible to find an experienced and energetic fruit grower assert that he cannot make a living." Taking up the various kinds of fruit in turn, he gives sensible advice with regard to them, insisting, especially, that only a very few varieties—and those the very best—of each kind should be grown. But the most interesting part of his article to American readers is where he insists that the best English fruit is better than the best imported kinds, and that tradesmen, as well as the public, are well aware of the fact. "Who," he asks, "would buy a pound of Newtown Pippins (the best imported apple), when he can obtain the luscious Cox's Orange Pippin, or who would eat a Baldwin when a Blenheim Orange apple is available? The English fruiterers—not a class given to sentiment—are so conscious of this fact, that in London, at the present moment, nearly every American apple sold is labeled 'Choice English Fruit.' So with grapes, pears, plums, tomatoes, and even with walnuts and other kinds of nuts. . . . The buyers for the foreign restaurants . . . are as eager as other purchasers to obtain English fruit, and pay for it a much higher price than for foreign produce. The reason for this superiority of home grown produce I attribute to the fact that, though our climate is proverbially fickle, it is, on the whole, more equable, and the season is more prolonged, than that of foreign countries. Though, to use an old English proverb, 'We get our sun by installments,' old Sol lingers with us long enough to slowly, but surely, ripen our fruit; and it is this prolongation of sun heat that seems to render our English out-door fruit so full of rich juices—the very point in which the imported fruit is lacking." Those who have eaten American fruit in America and English fruit in England may not agree with Mr. Morgan in his conclusions. But the facts he gives are undoubtedly trustworthy, and if his anticipations with regard to the prospects of fruit culture in England are equally so, American producers may well fear some diminution in their export trade. The chief obstacle to the industry he finds in a fact which has no parallel with us and which may prove very difficult to overcome. Few English horticulturists are able to own their own land; few landlords are willing to cut up their large existing farms into the smaller holdings more suitable for fruit culture, or to rent them on long leases, with satisfactory guarantee against ultimate loss to the tenant on the orchards he may plant; and, meanwhile, men are naturally averse to putting their money permanently into ground which they hold on year-to-year leases, without any pledge securing its return to them in case of dispossession.

Notes.

M. Paillet, in *Revue Horticole*, finds saddle-grafting the most desirable with Rhododendrons.

Fifty-five distinct varieties of Pansies were shown not long ago at a meeting of the Wisconsin Horticultural Society by a single exhibitor—Mr. William Toole.

No less than 2,000 species of flowering plants have been collected at Mount Bair, Tonkin, by M. Balansa, a French explorer. Numerous species of Oak abound in the forests.

Near Philadelphia, on the 8th of January, fully-expanded blossoms were quite abundant on a *Jasminium nudiflorum*, which stands fully exposed towards the north and west, and buds were opening on a Japan Quince in a sheltered position near by.

M. André, commenting in the *Revue Horticole* upon the reprint of a catalogue published in 1790 by a French nursery-gardener, finds the fact interesting, that among the thirty varieties of Peach and sixty-one of Pear are found all the best and most popular varieties cultivated to-day, with the exception of those of American origin.

The *Revue Horticole* records the fact that a Nectarine tree at Montrouge, near Paris, bore the past season a crop of Peaches, but no Nectarines. This is not the first time that this has been observed, and it is not unusual to find an occasional Peach among Nectarines, a fact which seems to point pretty clearly to the varietal origin of this fruit.

Mr. T. S. Brandegee left San Francisco on the 3d instant for Magdalena Bay for the purpose of exploring the botany of Lower California. The plants of this whole region are as little known as those of any part of the North American Continent, and large collections and important results may be expected from Mr. Brandegee's investigation.

The Messrs. Veitch have imported from a French nurseryman specimens of a red-fruited Ivy, to which the name *Hedera aurentiaca* has been given! No fruit has yet been perfected on English soil, but, as a local journal says, if the variety fruits prolifically and is good in other respects, it should prove a welcome addition to the list of ornamental evergreen plants.

The cultivation of Pampas grass seems to be spreading in California. Formerly the only place where it was grown was Santa Barbara, but now large plantations may be found in many other neighborhoods. As the grass needs no treatment after cutting, but to be dried in the sun for a few days, the cost of harvesting is small and the profits proportionately large. A California journal declares that an acre of land will yield $250 worth of plumes.

Few persons know that the fruit of the Horse-Chestnut has any economic value. But a recent report of the Agricultural Department in Washington states that a flour is prepared from it with which a paste is made for the use of bookbinders —the bitter taste preventing the attacks of insects which are often so destructive when a more palatable kind of paste is employed.

The fourth number of *Lindenia* contains portraits and descriptions of the following Orchids: *Liptotes bicolor*, introduced from Brazil in 1831, a species with white flowers, with a red lip tinged with violet; *Odontoglossum Halli*, a Peruvian species, which bears the name of its discoverer; it has yellow flowers spotted with brown; *Cypripedium Mastersianum* and *Vanda cærulea*.

M. Ed. André publishes, in a recent issue of the *Revue Horticole*, a preliminary list, with characters, of the new species and varieties of Bromeliads—no less than eighty-three in number—discovered by him during his journey in South America in 1875 and 1876. An important work upon these plants, with figures and more detailed descriptions, is announced and may soon be expected.

The leaves of *Galax Aphylla* at this season are remarkably beautiful, and they are now gathered in considerable quantities on the mountains of western North Carolina and sent north to be used in winter decoration. Florists might make good use of them in certain arrangements. The leaves range in color from a bright, glossy green to deep crimson, maroon and dark bronze, and often richly variegated.

The State Horticultural Association of Oregon has prepared a bill for the creation of a State Board of Agriculture, which will be introduced in the coming session of the Legislature. It looks to the protection of the fruit industries of the state—directing that the Board shall have power to enforce certain restrictions, appoint an inspector of fruit-pests, etc.—and also to the advancement of horticulture in other ways.

A florist of this city recently exhibited in his window some flourishing plants of the common Red Clover (*Trifolium pratense*), almost every leaf of which had four, five or six leaflets. The leaves are much smaller than those usually seen when the plant has grown out-of-doors, but were proportionately more delicate and graceful on their long stalks; and, set in large silver bowls, the plants were ornamental enough to be prized at this season even apart from their significance as harbingers of good luck.

Mr. G. P. Rexford, of San Francisco, is preparing, under the direction of the Department of Agriculture, an exhibit of California-grown Figs, for the coming Paris Exposition. It is proposed to make the fact more generally known that the Smyrna Fig of commerce, as well as another choice variety, the White Adriatic, is successfully grown in California, and in order that the whole industry may be represented, not only dried fruit, but Figs crystallized, pickled and preserved by all methods, are to be included in the exhibit.

It has been established by ample proof that injury to plums can be prevented by spraying the trees early in the season with one of the arsenites, but no explanation has been made as to whether the adult beetles are destroyed, or whether the poison reaches the young larvæ. From a late bulletin issued by the Cornell College Experiment Station it would seem to be established that the adult beetles gnaw the surface of fruits for food as well as for oviposition. Besides this they eat freely of the leaves of the tree, so that the curculio is freely exposed to destruction, without reference to its habit of oviposition or to the fruit food of the larvæ.

On the 5th of January the Museum of Natural History in this city, which contains the Jesup Collection of American Woods, was for the first time opened in the evening, and hereafter it will not be closed on Saturdays until ten o'clock, and on Wednesdays will be closed at the usual hour, but re-opened between eight and ten o'clock. Of course it would have been better for the public, and especially for that portion of it which can derive the most practical good from such collections, had the authorities consented to open the Museum on Sundays; but while awaiting the time when this change must surely be made, its opening on two evenings each week is a distinct benefit.

An interesting little article in *Popular Gardening* tells us that the first green-house known to have been constructed in America was built in this city in 1764, on the grounds of Mr. James Beekman, a property which lay where Fifty-second Street now runs. It was a small rectangular building with no sky-lights, but a solid hipped roof, and walls formed by a succession of simple piers and large windows. The next form adopted for green-houses had a hood-like roof with slanting windows. This was followed by the lean-to—a house with a back wall about twelve feet in height and a front wall about four feet in height, with a slanting roof of glass. Two of these structures joined together give, of course, the form now commonly employed.

The most popular ornamental baskets for florists' use seem just now to be rather large and shallow ones, with tall handles, bent to a rectangular shape, which are covered, body and handle both, with folds of ribbon. It is a question whether it is as tasteful to use such an extent of color in connection with flowers as to use the simple, harmonious tone of uncolored straw. Nevertheless, the public always fancies new and "effective" arrangements, and when the color of the ribbon contrasts properly with that of the flowers, and too many bows and streamers are not employed, these baskets are distinctly better than many we have seen in recent years. The fashion seems to have come from France, where baskets of this kind are often used to contain two or three pots with growing plants, the pots themselves being covered from sight with trimmings of green. Something may be learned from Parisian florists as regards the number of blossoms which should be used. Too often in this country we see more blossoms and less foliage than is desirable, while in Paris, even when cut flowers are used, four or six fine specimens, relieved against a great mass of green, are preferred to a more compact display in which the beauty of individual flowers cannot be so well revealed.

The Garden (London) recently offered a series of prizes for collections of photographs of rural and horticultural subjects taken by amateurs. The result has just been announced, and a very large number of pictures seems to have been submitted, showing much diversity of subject matter. The first prize fell to the Earl of Annesley for a collection of "interesting garden subjects"; the second to Mr. Good, for "pretty garden plants and country houses," and the third to Mr. Murray, for "fine old Devonshire gardens and country houses, Cork-trees at Mount Edgecumbe," and other similar subjects. A long list of minor prizes is also printed, and many of the photographs in question will be reproduced in the columns of *The Garden*. Some remarks appended by the editors to their list of prizes may well be quoted for the benefit of American photographers. Among the causes of failure they noted were: "The want of simple, natural ways of arranging cut flowers. The complex bundles generally seen look worse in a photograph than they actually are. The backgrounds, too, are not always considered in relation to the color of the flowers; a crowd of so-called 'artistic' objects around is fatal, as is the flower-jar all set over with a pattern. . . . Very common subjects now and then result in failure, as *Lilium auratum*, which has been so often well done. On the other hand, some beautiful common things are never done well—as the Apple, Pear or Thorn-tree in bloom, and many wild flowers."

"In Sweden," writes a correspondent of *The American Garden*, "railroad gardening has reached a considerable advancement far greater than it has in England. The state roads in particular have done much to adorn all their stations. The station buildings themselves, though unpretentious, are neat and tasteful in construction. The out-houses are always partially or wholly concealed, and are never unsightly even when most conspicuous. . . . An area of from two to four rods in width and from twice to ten times as long is devoted to the railroad gardens. The general plan of this ornamentation consists in planting so as to hide the outer boundary and in laying walks to various objects in such a manner as to represent a pleasure ground. The planting is always well done, mostly of native trees and bushes, and, better than all, the plants are cared for. At the larger stations these gardens are of considerable extent and form important openings in the city. The one about the central station at Stockholm is worthy the denomination of park. Between stations there are at short and regular intervals the residences of section overseers—the *banwakt*—about which are small and tidy kitchen gardens and beds of flowers and clumps of bushes. These houses are usually all of a pattern, small and attractive, and are furnished by the railroad company, along with a parcel of land for private use. The *banwakt* receives in addition a salary of 80 kroner (something over $20 per month), and has free transportation on the road to and from market and is given his uniform. A certain portion of the road is allotted to his care, and in addition to duties connected with the track itself, he keeps the roadside tidy. American railways have too much land lying idle along their lines to allow of tidy roadsides."